Conclusions: The TGS in OA patients was significantly weaker than that in control subjects. Although our results cannot explain a causal relationship between TGS and knee OA, a reduced TGS may influence dynamic balance and force generation for propulsion, and thus increase the mechanical stress on the knee. Moreover, a reduction in activity with the progression of knee OA may also result in a reduced TGS. However, although the TGS was significantly different between the groups, it was not significantly associated with knee OA. The BMI was significantly higher and the IKES was significantly lower in the OA group relative to the control group. Furthermore, using multiple logistic regression analysis, the BMI and IKES were significantly associated with knee OA. These findings are similar to previously published reports. The current patient population included a large number of severe OA patients with 48.7% with grade 4 and only 10.3% with grade 2. In addition, 71 of the 78 participants were patients who were hospitalised for a total knee arthroplasty operation. Thus, it is likely that this patient group had a long history of OA, which may have resulted in marked weight gain and decrease in the IKES. Therefore, the BMI and IKES might have had a stronger effect than TGS. Moreover, the control group comprised individuals who attended a municipal sports event by themselves. It might have an effect on the result of this study. Future studies will need to include more patients with mild knee OA and verify the biomechanical aspects.

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TARGETED PHYSIOTHERAPY TREATMENT FOR PATELLOFEMORAL OSTEOARTHRITIS: A RANDOMISED CLINICAL TRIAL

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Purpose: The patellofemoral joint (PFJ) is one compartment of the knee that is frequently affected by osteoarthritis (OA) and is a potent source of symptoms. However, despite the burden of PFJ OA, there is limited evidence for effective, compartment-specific interventions for this subgroup of people.
Therefore, this project aimed to evaluate whether a physiotherapy intervention, targeted to the PFJ, resulted in greater improvements in pain and physical function than physiotherapy-led OA-education.
Methods: People aged $\geq$ 40 years with PFJ OA (PFJ-specific history: anterior knee pain aggravated by activities that load the PFJ; and radiographic evidence of PFJ OA (lateral PFJ osteophytes observed on skyline radiographs), were recruited from the community. Volunteers had to report pain severity on aggravating activities of at least 30mm on a 100mm visual analogue scale (VAS). Those with moderate-severe tibiofemoral OA (Kellgren and Lawrence $>$ 2) were excluded. A randomised clinical trial evaluated the efficacy of physiotherapy and a home exercise program, compared to a physiotherapy-delivered education program. The targeted physiotherapy intervention included vasti and hip muscle retraining and strengthening, patellar taping, patellar and tibiofemoral mobilisation. All interventions were delivered in 8 individual sessions over 12 weeks by trained physiotherapists. Primary outcomes, evaluated by a blinded assessor, included: (i) patient perceived global rating of change (much worse, worse, same, improved, much improved); (ii) pain during aggravating activities on a 100mm VAS; and (iii) function with activities of daily living (ADL) subscale of the Knee injury and Osteoarthritis Outcome Score (KOOS) at 3 months. Global rating of change was dichotomised as no/moderate improvement (much worse, worse, same, moderate improvement) and marked improved (marked improved), and expressed as relative risk reduction and numbers needed to treat (NNT). We analysed continuous outcome measures using linear mixed regression models, including their respective baseline scores as a covariate, subjects as a random effect, treatment condition as a fixed factor and the covariate by treatment interaction. Analyses were repeated with participant characteristics (age, gender, BMI and radiographic disease severity) included as covariates. Statistical significance was set at $p = 0.05$.
Results: In total, 92 people fulfilled the eligibility criteria and were randomised to the physiotherapy ($n = 44$) and OA-education control ($n = 48$) and 81 people completed the 3-month follow-up (39 physiotherapy and 42 control; 88%). The characteristics of the 11 participants lost to follow-up were not different to those who completed the study. Participants in both groups were matched at baseline for demographic characteristics (Physiotherapy: age 56±10 yrs, BMI 27.2±4.0 m.kg$^{-‡}$; 45% female; OA-education: age 53±10 yrs, BMI 27.9±4.6 m.kg$^{-‡}$; 55% female). Targeted physiotherapy resulted in more people reporting marked improvement than the OA-education group at 3 months (relative risk 4.31; 95% confidence interval (CI) 1.79 to 10.36; NNT 3 (95% CI 2 to 5). These results were reflected in between-group differences in pain score (mean difference: 15.2 mm, 95% CI 3.4 to 27). However there were no significant effects on physical function as measured using the KOOS-ADL (out of 100) (mean difference: 6; 95% CI -1 to 12). No significant differences were observed between groups for attendance (mean (SD) number of sessions: Physiotherapy: 8 (2); OA-education 8 (1)). Log book of exercise compliance was obtained from 31 (71%) of participants in the physiotherapy group. Compliance with the home exercise prescriptions (i.e. 3 out of the required 4 times per week) was recorded by 77% or participants. There were no between-group differences in adverse events
Conclusions: A physiotherapy intervention, targeted to the PFJ, resulted in superior outcomes for patient perceived change and pain than physiotherapy-led OA-education. The difference in pain was greater than the minimal clinically important difference for this measure in PFJ pain and hence, is likely to be clinically meaningful. Management of knee OA may be enhanced by targeting interventions to the compartment most affected by the disease.

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DETERMINANTS OF DYNAMIC BALANCE AND MOBILITY IN INDIVIDUALS WITH KNEE OSTEOARTHRITIS

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Purpose: Poor dynamic balance and mobility are known risk factors for falling. Those with knee osteoarthritis (OA) have been shown to have deficits in dynamic balance and mobility compared to healthy controls and are reported to have a high prevalence of falls (nearly 50% of those sampled). However, general balance training interventions have had limited success. There is a need to better understand the factors that may contribute to poor dynamic balance and mobility, in order to develop successful targeted interventions that improve dynamic balance and mobility and reduce the risk of falling in those with knee OA. The purpose of this study was to identify potential determinants of dynamic balance and mobility in individuals with knee OA.
Methods: Individuals aged 50 and older with radiographically-confirmed medial compartment knee OA were recruited to participate in a single testing session. Dynamic balance and mobility was assessed using the Community Balance and Mobility Scale (CB&M) - a valid and reliable scale in those with knee OA. Participants were also assessed during tasks hypothesized to be potentially modifiable determinants of dynamic balance and mobility, including: anticipatory postural control, concentric and eccentric muscle strength, knee joint proprioception, and knee joint range of motion. Specifically, anticipatory postural control was assessed using a toe rise paradigm, where individuals were asked to complete a rise-to-toes movement as quickly as possible. Kinematic data were recorded using ten high speed digital cameras and the average duration, magnitude, and velocity of the anteroposterior center of pressure displacement during the anticipatory postural adjustment (APA) was analyzed. Peak eccentric and concentric strength of the plantarflexors, quadriceps, and hamstrings was recorded on an isokinetic dynamometer at 60°/s and 90°/s. Knee joint proprioception was assessed using a knee joint repositioning task, where the average absolute error at each target angle (15°, 30°, and 60°) was recorded. Active and passive knee joint flexion and extension were assessed in a supine position. Participants also completed a numerical rating scale of knee pain, the Physical Activity Scale for the Elderly, and the Brief Fear of Movement Scale, a valid measure of fear of pain and injury upon movement. Multiple linear regression was used to identify predictors of dynamic balance and mobility, as measured by the CB&M. $P < 0.05$ was considered significant.
Results: Twenty-two individuals (9M, mean (SD) age 66.0 (8.8) years, mean (SD) BMI 26.3 (3.5) kg/m^2) have participated to date. Of these individuals, six exhibited doubtful OA (Kellgren and Lawrence (KL) grade 1), seven had KL2 (mild knee OA), seven exhibited KL3 (moderate knee OA), and two exhibited KL 4 (severe OA). Participants scored an average 75 (12) points on the CB&M (out of 96). Mean (95% CI) values for outcomes included in the final model are provided in Table 1. The regression model containing knee pain, eccentric muscle strength of the plantarflexors, quadriceps and hamstrings, knee flexion range of motion and average APA velocity significantly predicted scores on the CB&M (R^2